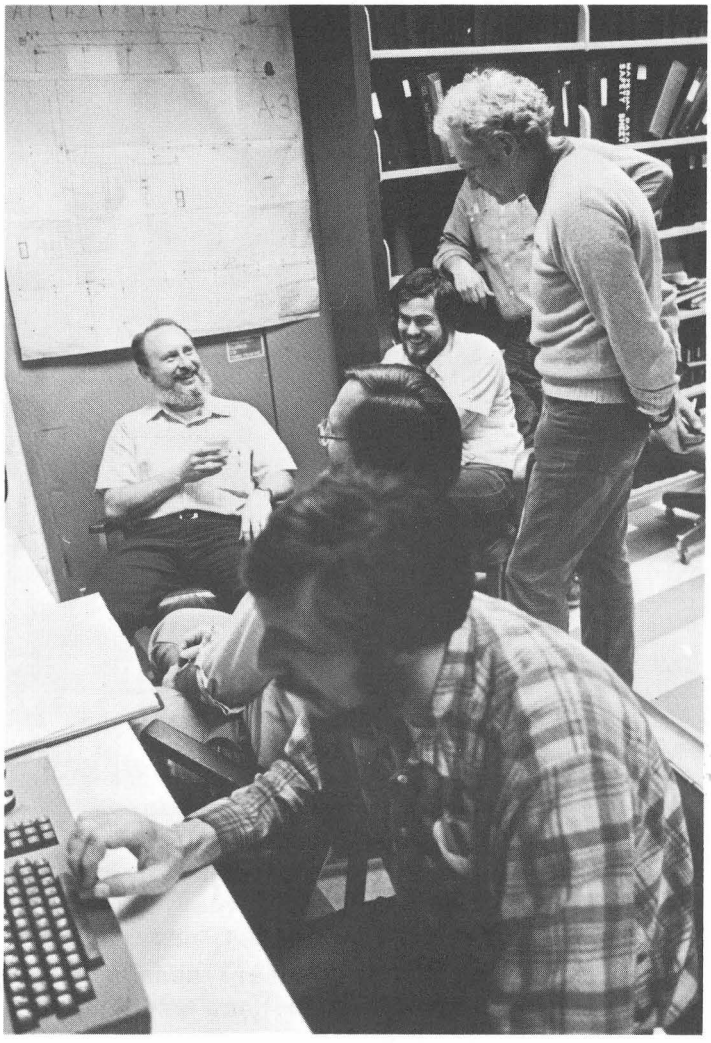
FERMI NATIONAL ACCELERATOR LABORATORY
March 4, 1982

FermiNews

NOISE, FOG MEAN SUCCESSFUL A-SECTOR TEST

At approximately 3:30 p.m. Friday, February 19, the denizens of the east side of Wilson Hall were treated to a dramatic demonstration of the progress of the Energy Saver project. In the first major power test of the Energy Saver, all the A-sector magnets were successfully energized to a level corresponding to operation at 500 GeV and ramped to that level for 1-1/2 hours at a 72-second repetition rate. Before proceeding to higher levels, a "worst-case" test was given the sophisticated systems designed to rapidly remove the stored energy from the magnets in a controlled manner and to relieve the pressure built up in the helium. This procedure involves making all 94 dipoles in the system go normal (non-superconducting) at once by firing heaters in the magnets. The energy stored in the magnets dissipates by boiling the liquid helium used to keep them cold. The noise and fog seen from Wilson Hall were caused by cold helium gas escaping from relief valves on top of the refrigerators.

This spectacular success was accomplished through weeks of around-the-clock effort on the part of Saver and support group personnel who labored through a long summer and fall to install magnets, power supplies, refrigeration, controls, and associated equipment in the A1, A2, and A3 cryoloops--118 magnets, 25 spool pieces, 3 refrigerators, and 4 compressors--plus the Central Helium Liquefier. Behind the opportunity to install and test are years of R&D, testing, and fabrication effort by the dedicated workers of Fermilab. In addition to the efforts of the Energy Saver, many people of the Laboratory devoted much time over the past several years to get us to where we are now. Included among these are the Proton and Meson Departments, the Bubble Chamber groups, people at Paramount Warehouse who built cryogenic components, and the Neutrino Department, Research Services, Radiation Physics, and the Physics Department who helped with electronics, power supplies, and the controls effort.



Success is measured on the faces (left to right) of M. Hentges (at keyboard), P. Martin, G. Tool, D. Wolff, L. Lederman (standing), and P. Limon (background).

The operating groups of the Accelerator Division--the Main Ring, Booster, Linac, and Switchyard Groups--and the accelerator operators were of inestimable help in assembling and operating the Saver tests. Much of the R&D and fabrication work, and many of the tests are being carried out by the Accelerator Support Groups, particularly the Controls, Electrical, and Instrumentation Groups. The magnets were put into the tunnel and made leak-tight through the dedicated work and long hours of the Mechanical Support and Conventional Mechanical Devices Groups.

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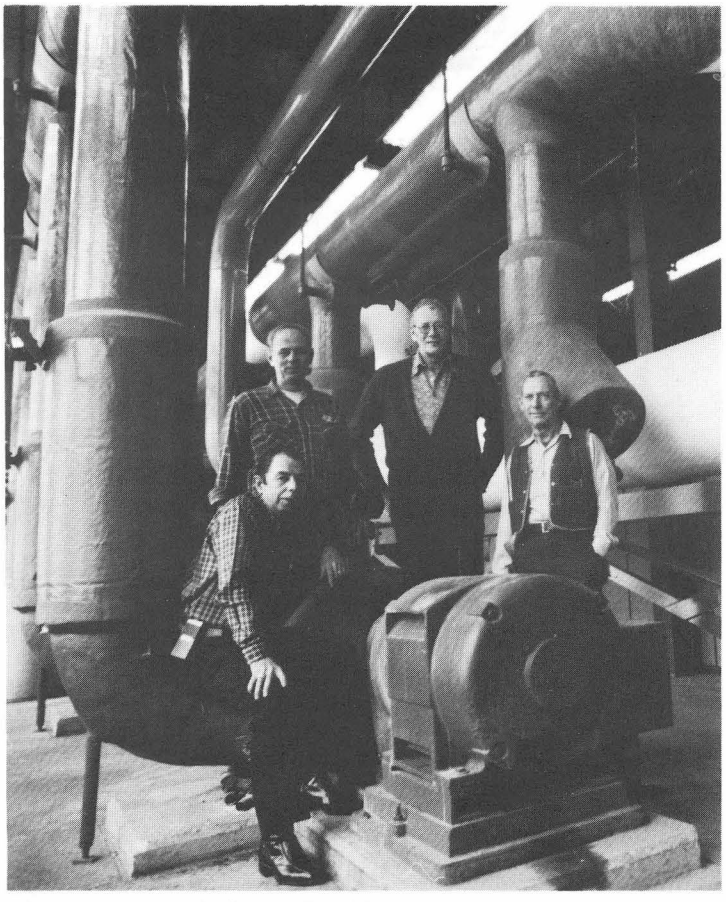
NEW EQUIPMENT CONSERVES TIME, ENERGY, AND MONEY



(Left to right) Jack Mills, Dennis Bowron, Bill Riches, manager, and Buryl Allgood of Plant Maintenance check out the new heat exchanger.

SYSTEM LOWERS ENERGY BILLS

Fermilab will save $65,000 in electricity during each winter season since recently installing a new heat exchanger at the Central Utility Plant. The new system generates cooling water for accelerator components by pumping cold pond water from Swan Lake and West Pond. One 1500-ton chiller was previously required to produce 50° low-conductivity water (LCW) for accelerator cooling and 42° chilled water for the Linac, Cross Gallery, and Transfer Gallery air-conditioning systems, and for the Main-Ring rf cooling systems. This required an average of 1450 megawatt hours of electrical energy each winter. Under the new system, 6000 gpm of cooling pond water, at a temperature of 40° or less, is pumped directly through the three existing 50° LCW heat exchangers, through the new chilled-water heat exhanger, and through the three 95° LCW heat exchangers as before; the discharge water from the seven heat exchangers then flows out to Swan Lake.

COMPUTER CUTS DRAFTING TIME

by Hank Hinterberger

Fermilab's designers and drafters will soon be able to produce drawings two to three times their current rate!

Newly purchased computer-aided design (CAD) equipment in the form of a new software program, called CD/2000, and a Tektronix 4114 interactive graphics terminal, now run on one of the Computing Department's Cyber computers. Now a designer can execute commands by simply touching a "pen" to symbols on a special "tablet." When a design is complete, the drafter instructs the computer to produce the drawing on a large pen plotter located in the Computing Department, Wilson Hall, seventh floor. The drafter can also make small checkprints on a hard-copy unit located at the work station.

There are two work stations at the Laboratory; one is in Drafting Services, sixth floor, Wilson Hall, and another in the Conventional Magnet Facility.

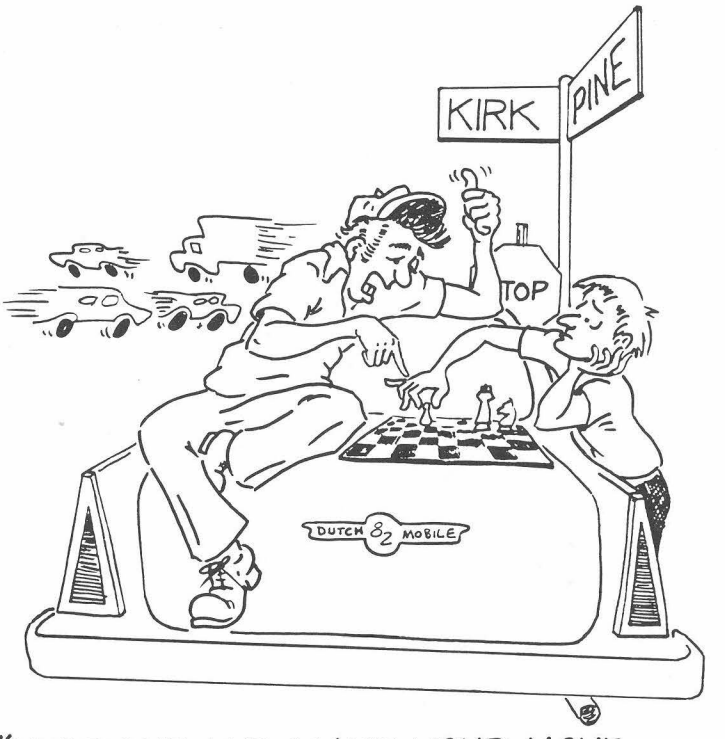
Jim Bishop, Drafting Services, and Jim Mulvey, Conventional Magnet Facility, are instructors for the new design aid. When enough people are trained, they will operate two shifts at both stations to fully utilize the new equipment.

Serving on the CAD committee are (front row left to right) Carl Lindenmeyer, Jim Bishop, Gerry Tool (chairman), Gus Rehbein, John Ingebretsen, and (back row left to right) Hank Hinterberger, Jim Mulvey, Tom Droege, Wes Craddock, and John Kowalski.

STATE APPROVES STOPLIGHT AT MAIN ENTRANCE

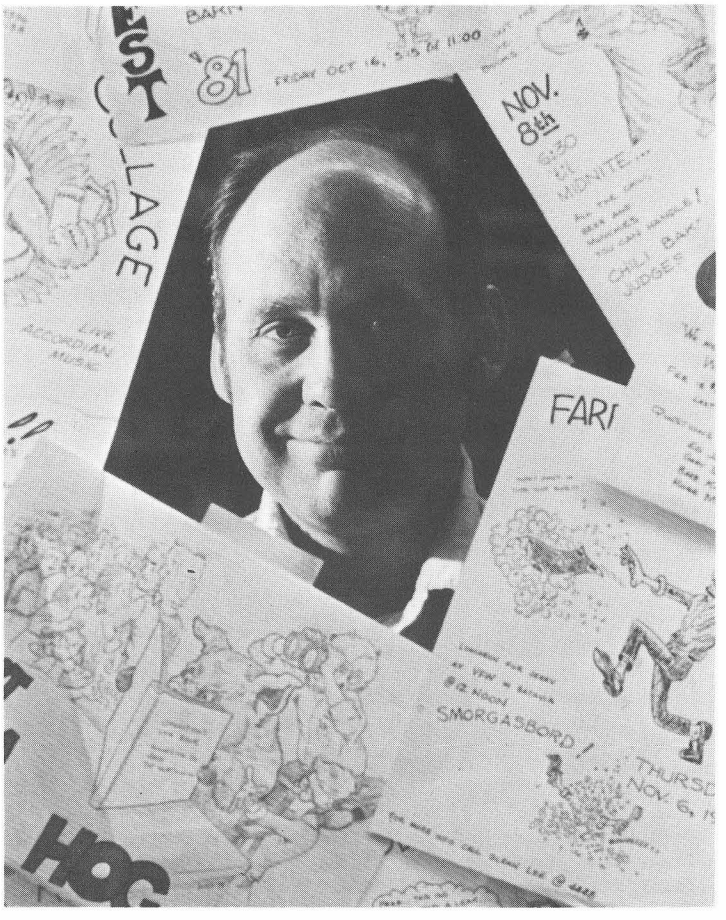
A stoplight at Pine and Kirk will be installed this spring fulfilling repeated requests made since 1973. The installation should reduce, if not eliminate, accident statistics citing 29 accidents involving 27 injuries and one death at the site between 1975 and 1981.

The persistence of Bud Stanley, Building Management, and Batavia City Council alderman, has helped make the installation a reality. Acting upon Stanley's perennial request, the city council persuaded the county to conduct a survey of the intersection in 1979; unfortunately, the county concluded that a light was unnecessary at that time. Last summer, however, a new survey indicated tremendous need. Fermilab quickly agreed to pay up to $50,000 for the light, provided the city agreed to operate and maintain it. The state soon granted its approval, bids were solicited, and the contract was awarded. Construction is scheduled to begin as soon as the ground thaws, probably late April or early May.



"HURRY UP AND MAKE YOUR MOVE.... THE TRAFFIC LIGHT WILL BE INSTALLED SOON!"

CARTOONIST MEASURES SUCCESS BY LAUGHTER



by Phyllis Gibson

The mad scientist brewing his ghoulish gruel for the Chile Bakeoff, the buffalo protesting the Chip Throwing Party, and many other zany NALREC posters, which amuse Fermilab employees while reading bulletin boards or waiting for an elevator, originate in Mark "Dutch" Koenig's sense of humor.

Since he was old enough to hold a pencil, Dutch Koenig, electronics technician in the Main Ring Division, has been cartooning. Dutch received encouragement from classmates as early as the third grade. "The more they laughed, the more I drew. The more I drew, the better I got, and the more they laughed."

Dutch has never studied art formally but cites Ed Kelly, originator of **Pogo**, as his greatest influence. "He managed to give cartoons a three-dimensional quality that I have always tried to imitate. Once while watching some early cartoons in a tribute to Walt Disney's career, I was surprised to recognize Kelly among the

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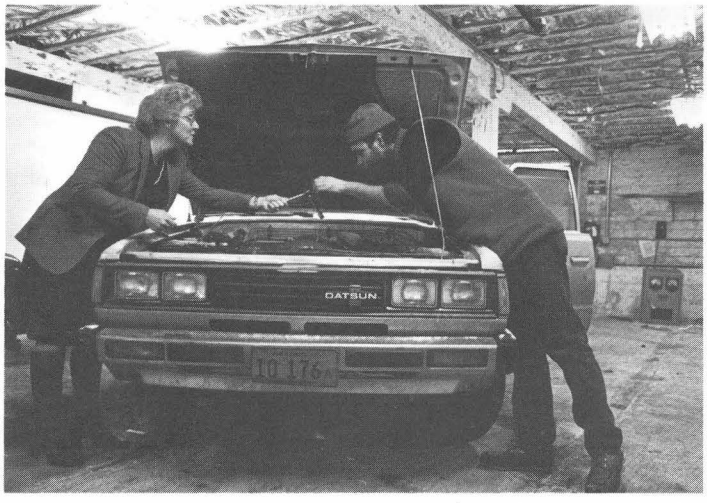
animators. I couldn't identify what it was that I liked about those oldies, but it was probably Kelly's style."

When asked if he has received much pay for his work, Dutch replied, "Finding someone who really gets a good laugh from my drawings is the best kind of pay."

His favorites display subtlety. He signs all of his works, but finding his signature is like spotting Hitchcock entering each picture he directed.

CLUB FINDS CAR REPAIR SITE



Phyllis Hale of the User's Center checks out new facilities for Car Club founded by Jim Volk, Ohio State University.

A newly formed Car Club, located in the Anderson Barn on Sauk Circle, provides a warm, dry, well-ventilated site for making minor repairs on personal cars. Employees interested in joining can obtain further information at the Users Office. There is a $10 membership fee to cover insurance.

STRIKE, DINE BY CANDLELIGHT

NALREC will sponsor their Annual Candlelight Bowling at Warrenville Bowling Alley Saturday, March 13, from 9 p.m. to 1 a.m. A buffet dinner plus many door prizes will follow four games of bowling where a strike entitles the bowler to a free drink. Tickets sell for $9 per person and may be purchased through Friday, March 5, from Lucy Reuter, 4623, Jesse Guerra, 4305 or 3198, Ed LaVallie, 3138, Ed Justice, 4668, or Dom Carullo, 3555.

MAGNETS REACH GOAL

(cont. from pg. 1)

Through January the staff of the Energy Saver struggled to understand and master for the first time the simultaneous operation of three satellite refrigerators, compressors, and the vacuum system from the Main Control Room. The remote operation of this complex, interconnected system is made possible by the use of many microprocessors and computers, working in concert because of the heroic efforts of the Accelerator Controls Group.

After about two weeks were spent attempting to fill the 2400 foot string of magnets with liquid helium using only the three satellite refrigerators, the Central Helium Liquefier was put on line. Within six hours the magnets started to fill, and ten hours later the system, about one-eighth of the complete Energy Saver, was filled with liquid helium and ready to be powered. The Central Helium Liquefier, the largest in the world, performed even better than it was designed to do.

Now it was the turn of the Power Supply Group to prepare for the crucial test of bringing the magnets up to a current of thousands of amperes as the first step toward the current of 4440 amperes that gives the magic current of 1 TeV. Enormous forces are involved at these high energies so each step must be carefully planned and its consequences studied before proceeding to the next step.

After the data from Friday's spectacular quench are all carefully evaluated, the current will be raised step by step until the planned operating mode for the Tevatron is achieved. Prosit!

Editor's Note: On Tuesday night, February 23, the A-sector test current was raised to the equivalent of 600 GeV.

Congratulations To. . .

[redacted]

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RETIREMENT SAVINGS DEFER TAXES

The Employee Benefits Office cites several ways employees can increase their retirement savings while also benefiting from new income deferments. A principal way was created by the Economic Recovery Tax Act of 1981 which permits any employee to open an Individual Retirement Account (IRA). The Act also allows companies to now accept "qualified voluntary employee contributions" (QVEC) as an alternative to IRA's. Both options are additions to Fermilab employees regular TIAA/CREF retirement plan and Supplemental Retirement Annuities (SRA's).

The following information summarizes the ground rules for IRA's and QVEC's.

- An employee may contribute up to $2,000 per year to either plan and deduct it from taxes. Two-income couples (if each earns over $2,000 per year) may each have an IRA or QVEC for a combined total of $4,000. Employees with a non-working spouse may contribute up to $2,250 and set up a spousal IRA separate from the employed spouse's account. Contributions to the employee and spousal accounts may be divided in any manner the couple decides as long as a minimum of $250 is in the spousal IRA. Earnings on the investment(s) are tax deferred.

- Payments are made from after-tax income but are deductible on the employee's tax return (either standard or itemized deduction).

- Earnings on the investment are tax deferred.

- When money is withdrawn from an IRA, it is taxed as ordinary income.

- Withdrawal of monies before age 59-1/2 is subject to a special tax penalty of 10% in addition to the normal income taxes.

- Money in a QVEC may be rolled over into an IRA and money in IRA(s) may be switched into another IRA(s) without penalty from the IRS.

- An individual may have several IRA's or both an IRA and QVEC; however, the total tax deductible amount may not exceed $2,000.

- The investment alternative for a QVEC is TIAA and/or CREF.

- The investment alternatives for IRA's include almost any investments except collectibles (tangibles) and commodities, e.g., money market, certificates of deposit, savings accounts, etc. These alternatives are available through savings and loans, banks, credit unions, brokerage houses, and insurance companies.

- Contributions may be paid on a periodic basis or in a lump sum.

- Withdrawal must begin at age 70-1/2.

- Withdrawals may be made before age 59-1/2 if one is disabled.

Persons who are not participating in a Supplemental Retirement Annuity or taking the maximum tax deferred amount have yet another alternative. Employees may make their contribution to TIAA/CREF through salary reduction, i.e., their salary is reduced by the amount and taxes are deferred on this portion until retirement income is received. If employees choose salary reduction for their TIAA/CREF payments, they still may participate in Supplemental Retirement Annuities (SRA's) which are separate contracts in TIAA/CREF. Employees may contribute a specified dollar amount or the maximum amount allowable by law, which is between an additional 3.5% to 7% of gross salary over the combined employer and employee amount contributed to the regular pension plan.

An advantage to SRA's is that partial or full withdrawal can be made without penalty (as opposed to 10% for an IRA). Partial withdrawal must be a minimum of $1,000 and not made more often than every six months. If full withdrawal is made, the account cannot be reopened until the next calendar year. Individuals selecting TIAA/CREF for investments may consider taking the maximum SRA before selecting the QVEC because of the withdrawal advantage of SRA's.

Under the new law, Fermilab will soon offer QVEC's to employees. For employees wishing to participate, TIAA/CREF will issue separate contracts. Contributions will be made through payroll deductions, however, detailed instructions have not yet been issued by TIAA/CREF. Fermilab will not offer payroll deductions for IRA's because the wide variety of plans available would make the service unwieldy.

When studying the various types of IRA's, financial analysts recommend asking the following questions:

- What are the annual fees and commissions?
- How many investment options are within the account?
- What, if any, are the restrictions of moving the money out of the account?
- What is the minimum initial investment? Minimal amount of additional investments?
- If rate of return is variable, is it tied to government securities or management decision?
- Is interest compounded daily or quarterly?

Be sure to compare like figures. Investors should ask the institution to give yields based on daily compounding or give figures showing how many dollars will be earned annually for each $1,000 invested.

For more information on TIAA/CREF's, SRA's, and QVEC's plus general information on IRA's, contact the Employee Benefits Office, Wilson Hall, 15E, ext. 4361.

(Save this sheet for personal records)